

51,243

Rec'd PCTO 13 OCT 2004

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 October 2003 (30.10.2003)

PCT

(10) International Publication Number
WO 03/089267 A1

(51) International Patent Classification⁷: B60P 1/64, 3/42, 3/33, 3/345, B60D 1/36, B62D 53/04, 63/08

(21) International Application Number: PCT/AU03/00449 ✓

(22) International Filing Date: 15 April 2003 (15.04.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PS 1759 ✓ 17 April 2002 (17.04.2002) AU
2003203469 ✓ 1 April 2003 (01.04.2003) AU

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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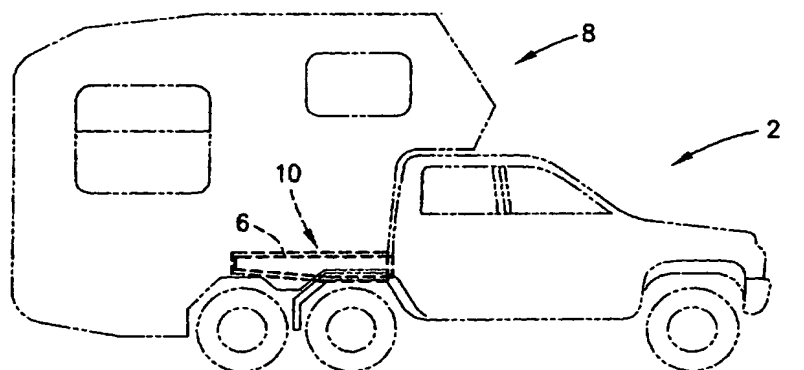
Published:

— with international search report

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MOUNTING APPARATUS ✓



(57) Abstract: Apparatus for a vehicle assembly comprising a self propelled vehicle (2) and a load mountable to the vehicle (2) in a mounted position relative to the vehicle (2) and being detachable therefrom, the apparatus incorporating a drive means which is selectively drivable to move the load away from the mounted position on the vehicle (2). In an another embodiment there is a disclosure of a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom, wherein the vehicle is provided with a first guide means fixed thereto and the load is provided with a second guide means fixed thereto, the guide means are mutually cooperative to facilitate the mounting of the load relative to the vehicle, the first guide means being of complementary shape to the second guide means when on the mounted position.

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MOUNTING APPARATUS

Field of the Invention

The present invention relates to a mounting apparatus for use in a vehicle assembly. In particular, although not exclusively, the invention relates to a mounting apparatus to mount a motor home to a vehicle. However, the invention is not strictly limited in its application to motor homes and may be applied to any situation where it is desirable to secure an auxiliary body to a vehicle.

Background to the invention

Caravanning is a popular pastime. However, there are difficulties associated with towing a caravan behind a vehicle. In particular, inexperienced drivers may find the articulated nature of the caravan and vehicle presents difficulties in manoeuvring the caravan, especially backwards. Furthermore, accessibility of a vehicle and a towed caravan may be limited. A popular alternative is a motor home. However, there are some distinct disadvantages associated with motor homes too. For example, once a suitable campsite base has been selected, if it is further desired to explore in the vehicle away from the campsite, the whole motor home must be packed-up and the contents secured before the vehicle can be moved. This may be particularly inconvenient for small day trips from the campsite base. Another disadvantage is that the motor home incorporates a whole vehicle which is not able to be used for other requirements.

It is therefore an object of the present invention to provide an apparatus which addresses the foregoing disadvantages or at least provides the public with a useful choice.

Summary of the invention

In accordance with a first aspect of the present invention, there is provided, an apparatus for a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom, the apparatus incorporating a drive means which is

selectively drivable to move the load away from the mounted position on the vehicle.

The apparatus is preferably slidably mounted to the vehicle and the apparatus is operable to overcome the frictional engagement between the load
5 and the vehicle. In a preferred form of the invention, the apparatus is also operable to secure the load in the mounted position.

In a most preferred form of the invention, the apparatus is also operable to draw the load towards the vehicle from a tripping position relative to the vehicle to the mounted position. A tripping means may also be provided to detect when the
10 load is in the tripping position. Preferably, the apparatus is operable to allow for the load to be partially mounted on the vehicle by driving of the vehicle, with the apparatus becoming operable to draw the load to the mounted position on the load reaching the tripping position relative to the vehicle.

The drive means is most suitably independent of the drive of the vehicle.
15 Where the invention operates to also secure the load to the vehicle, a single drive means may be provided to move the load away from the vehicle and to secure the load in the mounted position.

The apparatus preferably includes a clamp to clamp onto a predetermined fixed portion of the load, the clamp comprising two clamping portions, one
20 movable relative to the other between a released position and a clamping position, the clamp also being movable in use on a vehicle, relative to the vehicle. The clamp may be slidable relative to the vehicle. Furthermore, the clamp may be movable in the clamping position to move the load towards the mounted position. Preferably, the clamp is movable in the released position to move the load away
25 from the mounted position.

The two clamping portions of the clamp may comprise a forward clamping portion and a movable rearward clamping portion, the apparatus being such that when the rearward clamping portion is disposed in the released position and the predetermined portion of the load is moved adjacent to the forward clamping

portion, the rearward clamping portion is driven by the drive means to be moved to the clamping position, whereupon the drive means moves the clamp and thereby the load to the mounted position. Furthermore, the apparatus may be operable such that when in the mounted position, selective operation of the drive means causes the forward portion of the clamping means to move rearwardly and thereby move the predetermined portion of the load away from the mounted position on the vehicle.

In a most preferred form of the invention, the rearward clamping portion comprises a pivotally mounted toggle driven to rotate from the released position to the clamping position, such that on being further driven, the clamp is moved forwardly. A biasing means may be provided to bias the forward portion of the clamp rearwardly.

In accordance with a second aspect of the present invention, there is provided a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom, the vehicle assembly including the apparatus as claimed in any one of the preceding claims.

Preferably, the load comprises an accommodation unit. Alternatively, the load comprises a tray. The load may have a single axle and a plurality of struts to support the load when detached from the vehicle.

In a preferred form of the invention, the vehicle is provided with a first guide means fixed thereto and the load is provided with second guide means fixed thereto to position the load in the mounted position relative to the vehicle wherein the first guide means is complementary to the second guide means. The guide means may be tapered to facilitate positioning of the load relative to the vehicle. Furthermore, the first and second guide means preferably each comprise elongate members.

In accordance with a third aspect of the invention, there is provided an apparatus for a vehicle assembly comprising a self propelled vehicle and a load

mountable to the vehicle in a fixed mounted position relative to the vehicle and being detachable therefrom, the apparatus incorporating a drive means which is selectively drivable to draw the load towards the vehicle from a tripping position relative to the vehicle to the mounted position.

- 5 Any of the features described above in connection with the first and second aspect of the invention may have application to the third aspect set out above.

10 In accordance with a fourth aspect of the present invention, there is provided, a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom wherein the vehicle is provided with a first guide means fixed thereto and the load is provided with second guide means fixed thereto to position the load in the mounted position relative to the vehicle, wherein the guide means are mutually cooperative to facilitate mounting of the load to the vehicle and the guide means are tapered to facilitate positioning of the load relative to the vehicle, the first guide means being of complementary shape to the second guide means when in the mounted position.

20 The guide means may be of rectangular section and tapered in both dimensions of their cross-sections. Preferably, the first and second guide means each comprise a pair of spaced elongate members. In a preferred form of the invention, the members of the first guide means comprise bars of rectangular section and the members of the second guide means comprise channels, inwardly open.

25 In a most preferred form of the invention, the members of the first guide means are mounted to an upwardly facing surface of a trailing portion of the vehicle and the members of the second guide means is mounted to a downwardly facing surface of a leading portion of the load such that the leading portion of the load is mounted atop the trailing portion of the vehicle in the mounted position.

Brief Description of the Drawings

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a vehicle and an accommodation unit for
5 mounting to the vehicle;

Figure 2 is a side view of the accommodation unit mounted to the vehicle of Figure 1;

Figure 3 is a top plan view of the respective vehicle-mounted and load-mounted portions of a preferred form of the apparatus in accordance with a first
10 preferred embodiment of the invention;

Figure 4 is a cross-sectional view of part of the vehicle-mounted apparatus in Figure 3 along the line A-A;

Figures 5A, 5B and 5C are partial cross-sectional views showing the mounting operation of the apparatus of Figure 3;

15 Figures 6A, 6B, 6C and 6D are partial cross-sectional views showing the releasing operation of the apparatus in Figure 3; and

Figure 7 is a schematic diagram of the electrical circuit associated with the apparatus of Figure 3 for controlling the operation of the apparatus.

Description of the Preferred Embodiment

20 Referring to Figures 1, 2 and 3, a vehicle 2 has a trailing portion 4 that includes an upwardly facing surface 6 on which is rigidly mountable an accommodation unit 8 to enable transport of the accommodation unit 8 by the vehicle 2. The accommodation unit 8 includes a leading portion 10 having a downwardly facing surface 12 to which is attached a first portion 18 of a mounting
25 apparatus 14. A second portion 16 of the apparatus 14 is incorporated into the

trailing portion 4 of the vehicle 2 to project through the upwardly facing surface 6 such that the second portion 16 is engageable with the first portion 18 of the accommodation unit 8. When the respective first and second portions 18, 16 are brought together they enable rigid mounting of the accommodation unit 8 to the vehicle 2 for transport. Furthermore, the apparatus 14 enables disengagement of the accommodation unit 8 from the vehicle 2 thereby freeing the vehicle for use without the burden of the accommodation unit 8. It will be appreciated that the accommodation unit 8 is merely an example of the type of units which may be mounted to the vehicle. For instance, an alternative unit may comprise a tray for receiving a tradesman's equipment or a courier's packages.

The second portion 16, which forms the drive means 20 of the apparatus 14, includes a support bar 22 linked to the chassis of the vehicle 2 and a pair of spaced walls 24 depending from the bar 22. The walls 24 are joined by floor 25 (Figure 4) from the support bar 22. Each wall 24 has a bracket 26 attached thereto via bolts, such that a flange 27 on each bracket projects inwardly of the walls 24 to define a pair of spaced rails on which ride runners 28 of forward clamping portion 30. The forward clamping portion 30 further includes upstanding abutments 31 linked by a rigid web 32. A groove 29 formed in runners 28 receives a respective flange 27 to enable reciprocal sliding movement of the forward clamping portion 30 along the brackets 26 (Figure 4).

Mounted between the runners 28 midway along their length is a pivot shaft 34 on which a rearward clamping portion, formed as toggle 36, is pivotally mounted (Figures 5A and 5B). One end of the toggle 36 is mounted to the pivot shaft 34. Near the opposite end, a clevis pin 40 is mounted to enable pivotal movement of the toggle 36 relative to a clevis 38 also attached to the clevis pin 40. The clevis 38 is mounted to an hydraulic ram 44 such that reciprocal movement of the ram 44 causes rotation of the toggle 36 relative to the forward clamping portion 30. Extension of the ram 44 causes the toggle 36 to rotate upwardly toward the abutments 31 until a face 39 of the clevis 38 contacts the side of the toggle 36 intermediate the pivot shaft 34 and clevis pin 40 to arrest further rotational movement (Figure 5B). This is the clamping position of the toggle 36. From this

position, retraction of the ram 44 causes the toggle 36 to rotate away from the clamping position to the release position shown in Figures 5A and 6B.

The second portion 16 further includes guide means in the form of tapered members 56 that have a teflon coating on the opposed outer sides 58 to facilitate
5 sliding engagement with the first portion 18. A switch 90 located on one wall 24 (Figures 3 and 5A) is linked to a power source and activates the ram 44

A helical spring 48 fixed between projections 50 respectively located on the floor 25 and one of the runners 28 provides sufficient resistance to sliding movement of the forward clamping portion 30 such that initial extension of the ram
10 44 (Figure 5B) causes the toggle 36 to pivot upwardly toward the abutments 31. In the absence of the helical spring 48, initial extension of the ram 44 may cause sliding movement of the forward clamping portion 30 away from the ram 44 such that the pick up bar 74 is not moved to the clamping position. The spring 48 is also selected such that when in the mounted position, the resistance provided by the
15 helical spring 48 is not sufficient to overcome the frictional engagement between the tapered members 56 and channels 70 to drag the forward clamping portion 30 away from the mounted position.

An alternative to the helical spring 48 is shown in Figure 4 in the form of a resilient wire 52 located in the groove 29 between the runners 28 and edge of
20 flange 27. The resilient wire is formed with a curve (Figure 8) of sufficient length such that ends 54 project from the groove 29 to engage the ends of the runners 28 thereby retaining the resilient wire 52 within the groove during sliding movement of the forward clamping portion 30.

The first portion 18 of the apparatus 14 includes spaced channels 70
25 shaped complementarily to the tapered members 56 to receive the tapered members 56 in frictional engagement. The channels 70 are mounted to a frame 72 including a pick up bar 74 for clamping between the abutments 31 and toggle 36 when in the clamping position, and striker plate 76 for actuating the switch 90.

Assembly of the first and second portions 18, 16 is achieved by manoeuvring the vehicle 2 relative to the accommodation unit, such that the tapered members 56 are received in the channels 70. The rounded ends 57 of the tapered members assist with aligning the second portion 16 with the first portion 18 such that an angled or off-centre approach of the second portion 16 toward the first portion 18 will be corrected by the rounded ends coaxing the correct arrangement of the tapered members 56 within the channels 70. Further insertion of the tapered members 56 into the channels 70 brings the striker plate 76 closer to the switch 90. Upon a leading edge 78 of the striker plate 76 tripping the switch 90, the ram 44 is activated to extend the arm 42 and cause upward rotation of the toggle 36 relative to the runners 28. At the point that the ram is activated, the pick-up bar 74 is located in such proximity to the abutments 31 that the upward rotational movement of the toggle 36 captures the pick up bar 74 in a gap between the abutments 31 and toggle 36 in its clamping position (Figure 5B). At this stage the striker plate 76 remains in contact with the switch 90 such that the ram 44 remains activated. Further extension of the ram 44 causes sliding movement of the forward clamping portion 30 such that the pick up bar 74, and associated first portion 18, moves towards a mounted position as depicted in Figure 5C. The ram 44 is deactivated when the switch 90 disengages the striker plate 76 by falling off a trailing edge 80.

Operation of the ram 44 to drag the first portion 18 to the mounted position causes the tapered members 56 and channels 70 to frictionally engage, thereby assisting to retain the first portion 18 in the mounted position relative the second portion 16.

The accommodation unit 8 is disengaged from the vehicle 2 by manually actuating ejection button 92 (Figure 7). Such actuation trips ejection button switch 93 and breaker switch 94 such that the solenoids 96 activate the ram 44 to retract (Figures 6A, 6B). Initially, retraction of the arm 42 causes pivotal movement of the toggle 36 away from abutments 31 thereby releasing the pick up bar 74 from clamping therebetween. As the ram is retracted, the forward clamping portion 30 is pulled toward the ram 44 along the brackets 26, whereby the abutments 31 drag the pick up bar 74 of the first portion 18 in a rearward direction thereby breaking

the frictional engagement of the tapered members 56 with the channels 70 (Figure 6C). Rearward movement of the forward clamping portion 30 is arrested when one of the runners 28 trips the breaker switch 94 (Figure 6D) thereby breaking the solenoid circuit. At this point, the first portion 18 is free of the second portion 16 so
5 that the vehicle 2 can be driven away free of the encumbrance of the accommodation unit 8 and used for any purpose as the driver desires.

It will be appreciated that the accommodation unit would include a number of support struts for stabilising the accommodation unit 8 when it is not engaged with the vehicle 2. Preferably, the accommodation unit 8 further includes a
10 manually operated brake acting on the wheels of the accommodation unit 8 to further prevent movement of the accommodation unit 8 when it is free of the vehicle 2.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Apparatus for a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom, the apparatus incorporating a drive means which is
5 selectively drivable to move the load away from the mounted position on the vehicle.
2. The apparatus as claimed in claim 1 wherein the load is slidably mounted to the vehicle and the apparatus is operable to overcome the frictional engagement between the load and the vehicle.
- 10 3. The apparatus as claimed in claim 1 or claim 2 being also operable to secure the load in the mounted position.
4. The apparatus as claimed in any one of the preceding claims being operable to draw the load towards the vehicle from a tripping position relative to the vehicle to the mounted position.
- 15 5. The apparatus as claimed in claim 4 further including tripping means to detect when the load is in the tripping position.
6. The apparatus as claimed in claim 4 or claim 5 wherein the apparatus is operable to allow for the load to be partially mounted on the vehicle by driving of the vehicle, with the apparatus becoming operable to draw the load to the
20 mounted position on the load reaching the tripping position relative to the vehicle.
7. The apparatus as claimed in any one of the preceding claims wherein the drive means is independent of the drive of the vehicle.
8. The apparatus as claimed in claim 3 wherein a single drive means is provided to move the load away from the vehicle and to secure the load in the
25 mounted position.

9. The apparatus as claimed in claim 4 wherein the apparatus includes a clamp to clamp onto a predetermined fixed portion of the load, the claim comprising two clamping portions, one movable relative to the other between a released position and a clamping position, the clamp also being movable in use on a vehicle, relative to the vehicle.
10. The apparatus as claimed in claim 9 wherein the clamp is slidable relative to the vehicle.
11. The apparatus as claimed in claim 9 or 10 wherein the clamp is movable in the clamping position to move the load towards the mounted position.
12. The apparatus as claimed in any one of claims 9 to 11 wherein the clamp is movable in the released position to move the load away from the mounted position.
13. The apparatus as claimed in any one of claims 9 to 12 wherein the two clamping portions of the clamp comprise a forward clamping portion and a movable rearward clamping portion, the apparatus being such that when the rearward clamping portion is disposed in the released position and the predetermined portion of the load is moved adjacent to the forward clamping portion, the rearward clamping portion is driven by the drive means to be moved to the clamping position, whereupon the drive means moves the clamp and thereby the load to the mounted position.
14. The apparatus as claimed in claim 13 being operable such that when in the mounted position, selective operation of the drive means causes the forward portion of the clamping means to move rearwardly and thereby move the predetermined portion of the load away from the mounted position on the vehicle.
15. The apparatus as claimed in claim 13 or 14 wherein the rearward clamping portion comprises a pivotally mounted toggle driven to rotate from the released position to the clamping position, such that on being further driven, the clamp is moved forwardly.

16. The apparatus as claimed in claim 15 wherein a biasing means is provided to bias the forward portion of the clamp rearwardly.

17. A vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom, the vehicle assembly including the apparatus as claimed in any one of the preceding claims.

18. The vehicle assembly as claimed in claim 17 wherein the load comprises an accommodation unit.

19. The vehicle assembly as claimed in claim 17 wherein the load comprises a tray.

20. The vehicle assembly as claimed in any one of claims 17 to 19 wherein the load has a single axle and a plurality of struts to support the load when detached from the vehicle.

21. The vehicle assembly as claimed in any one of claims 17 to 20 wherein the vehicle is provided with a first guide means fixed thereto and the load is provided with second guide means fixed thereto to position the load in the mounted position relative to the vehicle wherein the first guide means is complementary to the second guide means.

22. The vehicle assembly as claimed in claim 21 wherein the guide means are tapered to facilitate positioning of the load relative to the vehicle.

23. The vehicle assembly as claimed in claim 21 or 22 wherein the first and second guide means each comprise elongate members.

24. Apparatus for a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a fixed mounted position relative to the vehicle and being detachable therefrom, the apparatus incorporating a drive means which is selectively drivable to draw the load towards the vehicle from a tripping position relative to the vehicle to the mounted position.

25. Apparatus as claimed in claim 24 wherein the load is slidably mounted to the vehicle and the apparatus is operable to overcome the frictional engagement between the load and the vehicle.

26. Apparatus as claimed in claim 24 or 25 being also operable to secure the
5 load in the mounted position.

27. Apparatus as claimed in any one of claims 24 to 26 wherein the apparatus is operable to allow for the load to be partially mounted on the vehicle by normal driving of the vehicle, with the apparatus becoming operable to draw the load to the mounted position on the load reaching the tripping position relative to the
10 vehicle, and further including tripping means to detect when the load is in the tripping position, the drive means being operable in response to the tripping means.

28. Apparatus as claimed in any one of claims 24 to 27 wherein the drive means is independent of the drive of the vehicle.

15 29. Apparatus as claimed in claim 26 wherein a single drive means is provided to draw the load to the mounted position and to secure the load in the mounted position.

30. A vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being
20 detachable therefrom, the vehicle assembly including the apparatus as claimed in any one of claims 24 to 29.

31. The vehicle assembly as claimed in claim 30 wherein the load comprises an accommodation unit.

32. The vehicle assembly as claimed in claim 30 wherein the load comprises a
25 tray.

33. The vehicle assembly as claimed in claim 30 wherein a variety of load types is provided and the self propelled vehicle is able to be mounted with any of them.

34. The vehicle assembly as claimed in any one of claims 30 to 33 wherein the load has a single axle and a plurality of struts to support the load when detached from the vehicle.

5 35. A vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mounted position relative to the vehicle and being detachable therefrom wherein the vehicle is provided with a first guide means fixed thereto and the load is provided with second guide means fixed thereto to position the load in the mounted position relative to the vehicle, wherein the guide means are mutually cooperative to facilitate mounting of the load to the vehicle
10 and the guide means are tapered to facilitate positioning of the load relative to the vehicle, the first guide means being of complementary shape to the second guide means when in the mounted position.

36. The vehicle assembly as claimed in claim 35 wherein the guide means are of rectangular section and tapered in both dimensions of their cross-sections.

15 37. The vehicle assembly as claimed in claim 35 or 36 wherein the first and second guide means each comprise a pair of spaced elongate members.

38. The vehicle assembly as claimed in claim 37 wherein the members of the first guide means comprise bars of rectangular section and the members of the second guide means comprise channels, inwardly open.

20 39. The vehicle assembly as claimed in any one of claims 35 to 38 wherein the first guide means is mounted to an upwardly facing surface of a trailing portion of the vehicle and the second guide means is mounted to a downwardly facing surface of a leading portion of the load such that the leading portion of the load is mounted atop the trailing portion of the vehicle in the mounted position.

Fig. 1

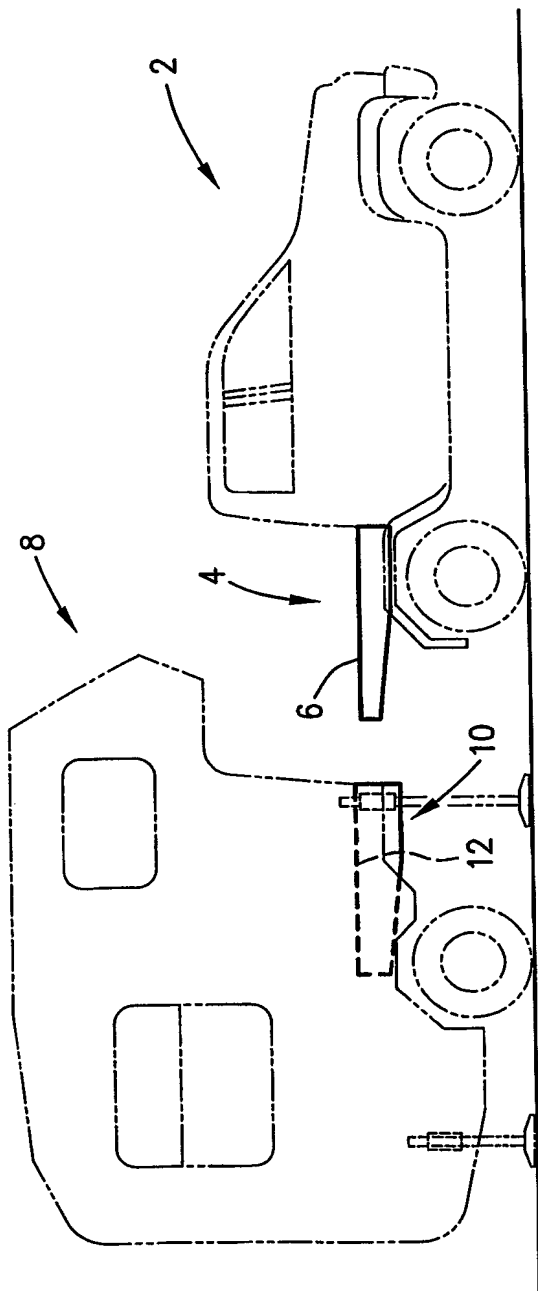
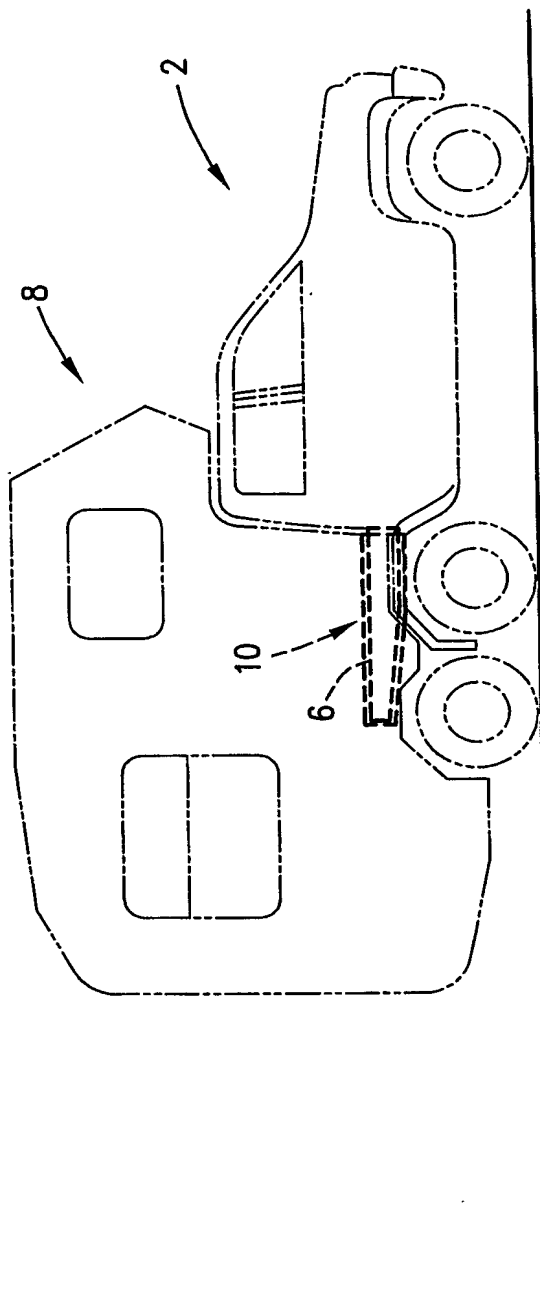
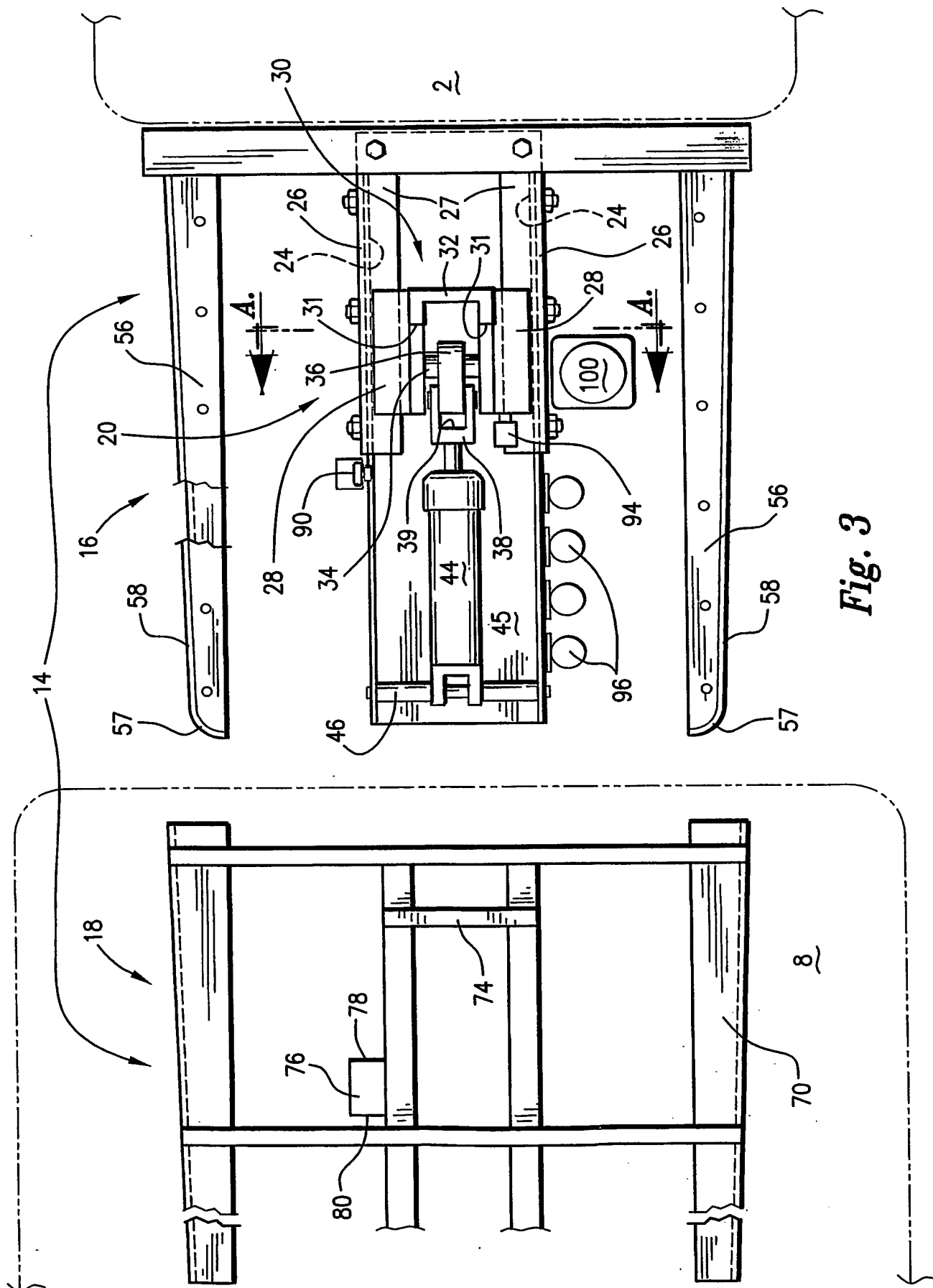
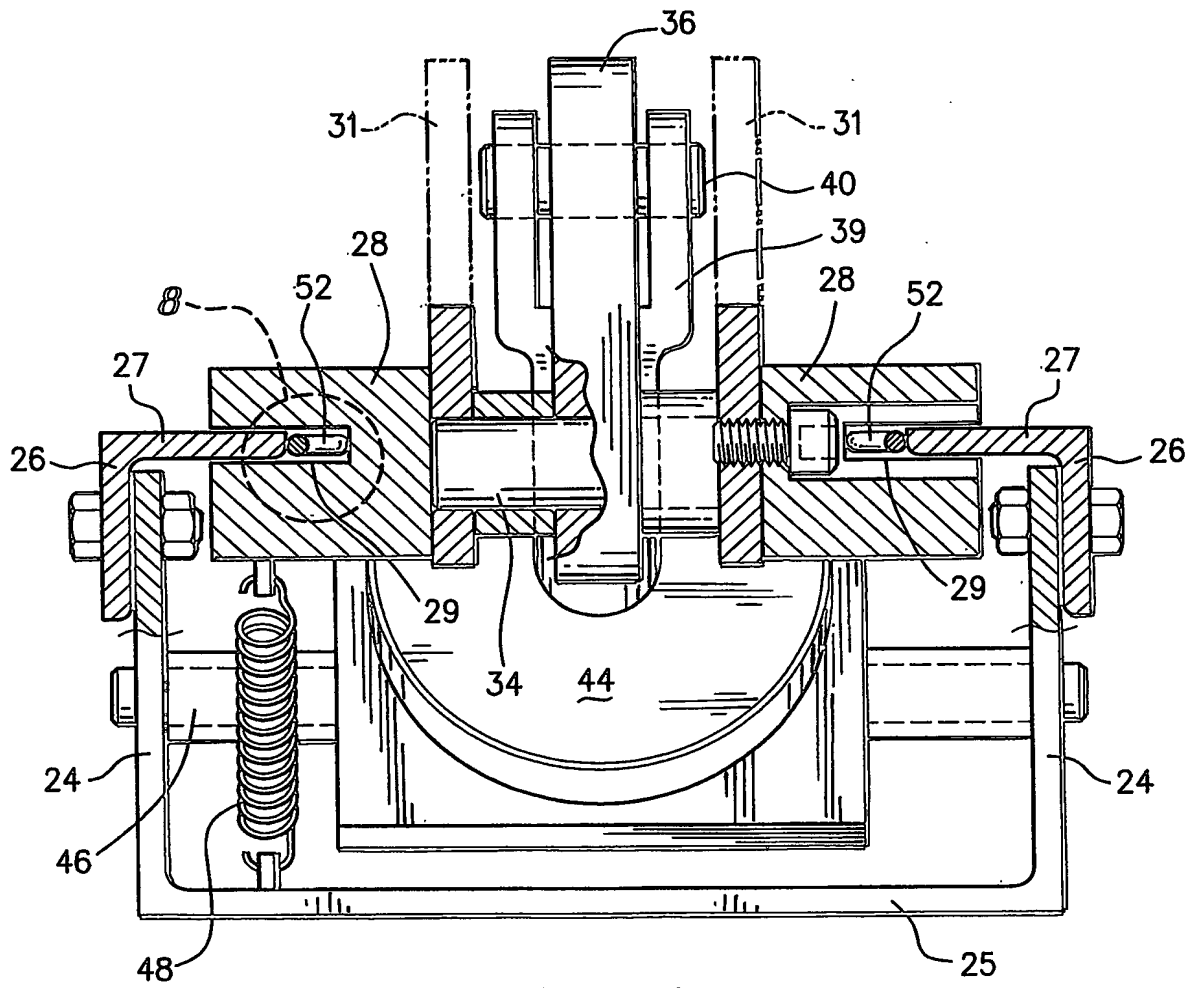
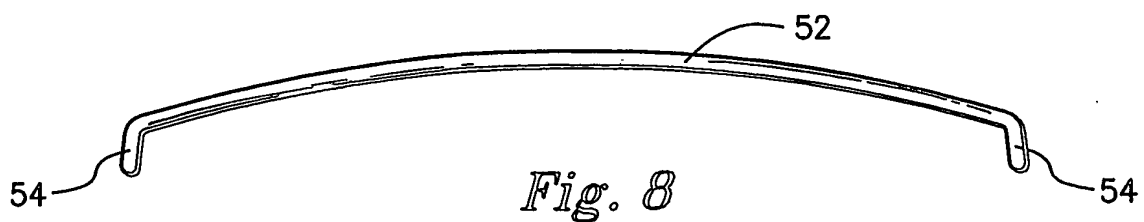


Fig. 2





*Fig. 4**Fig. 8*

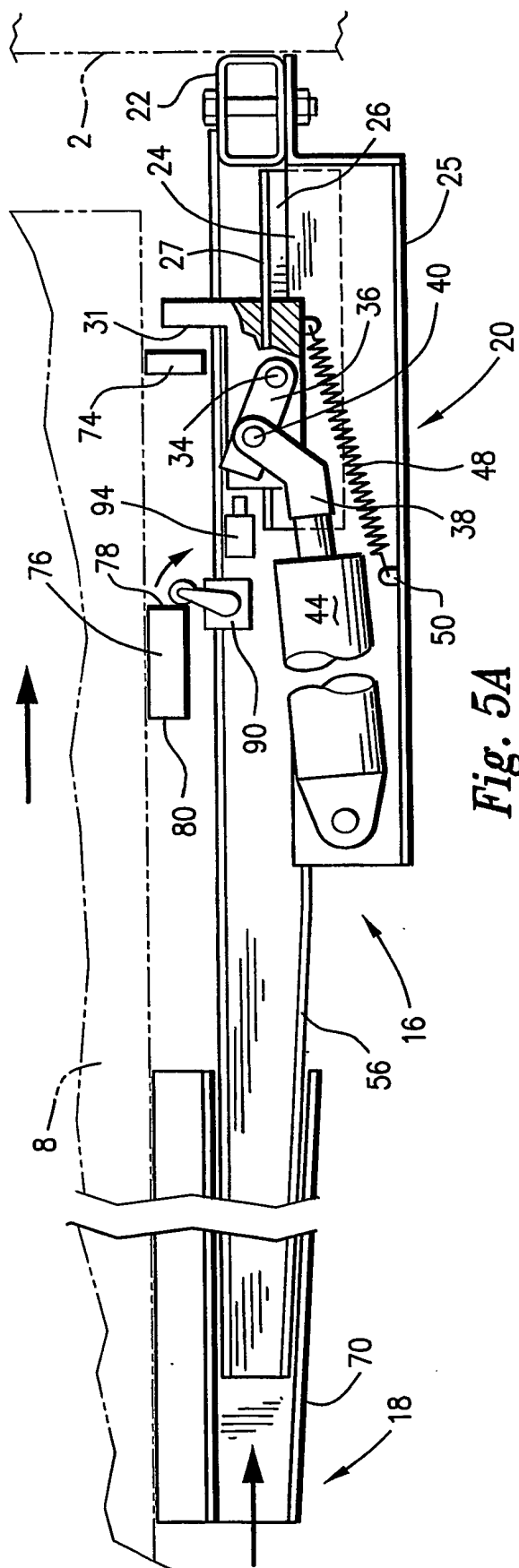


Fig. 5A

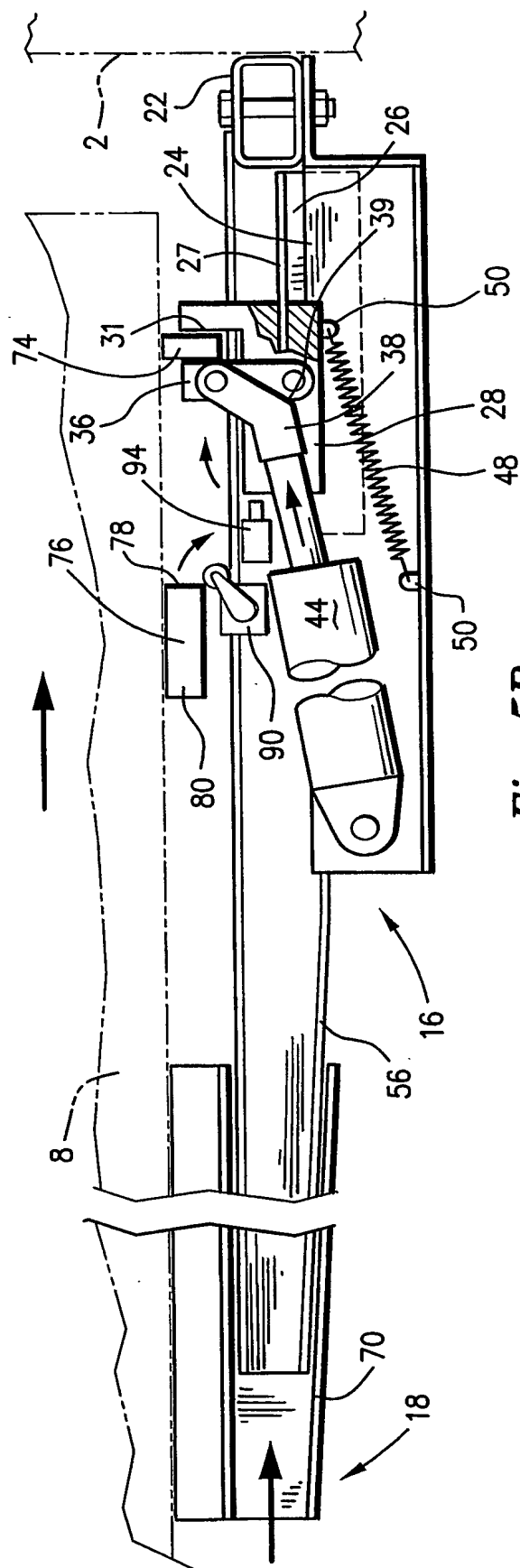


Fig. 5B

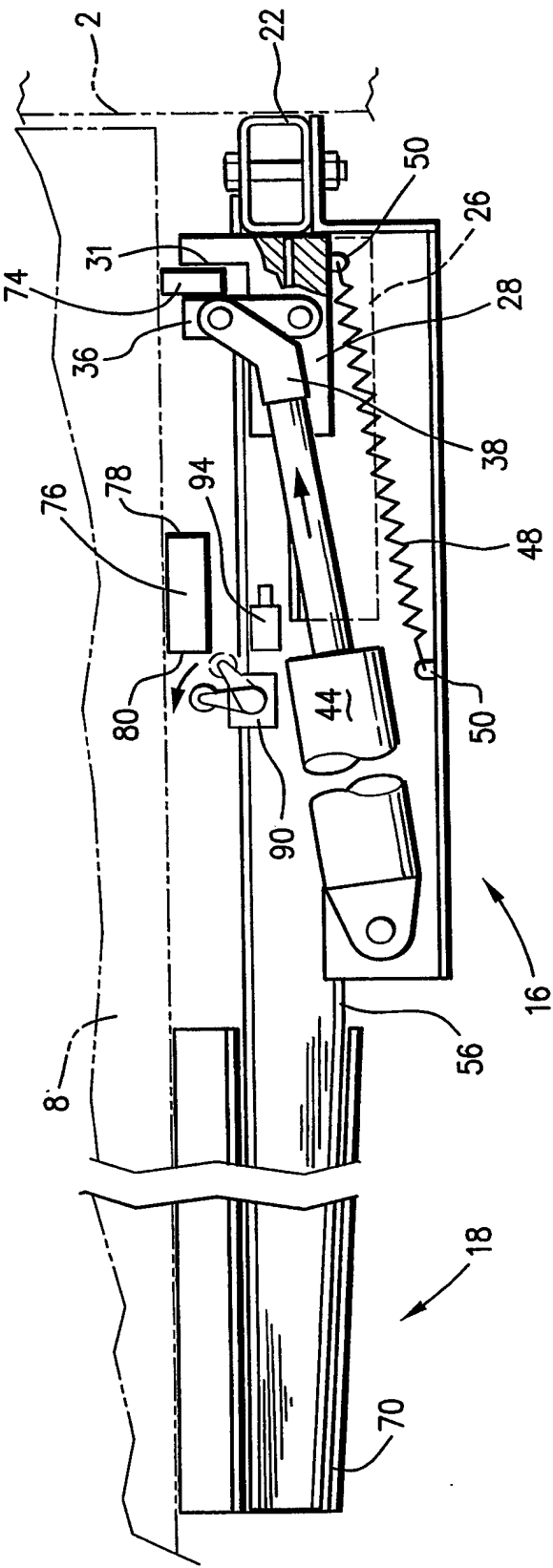
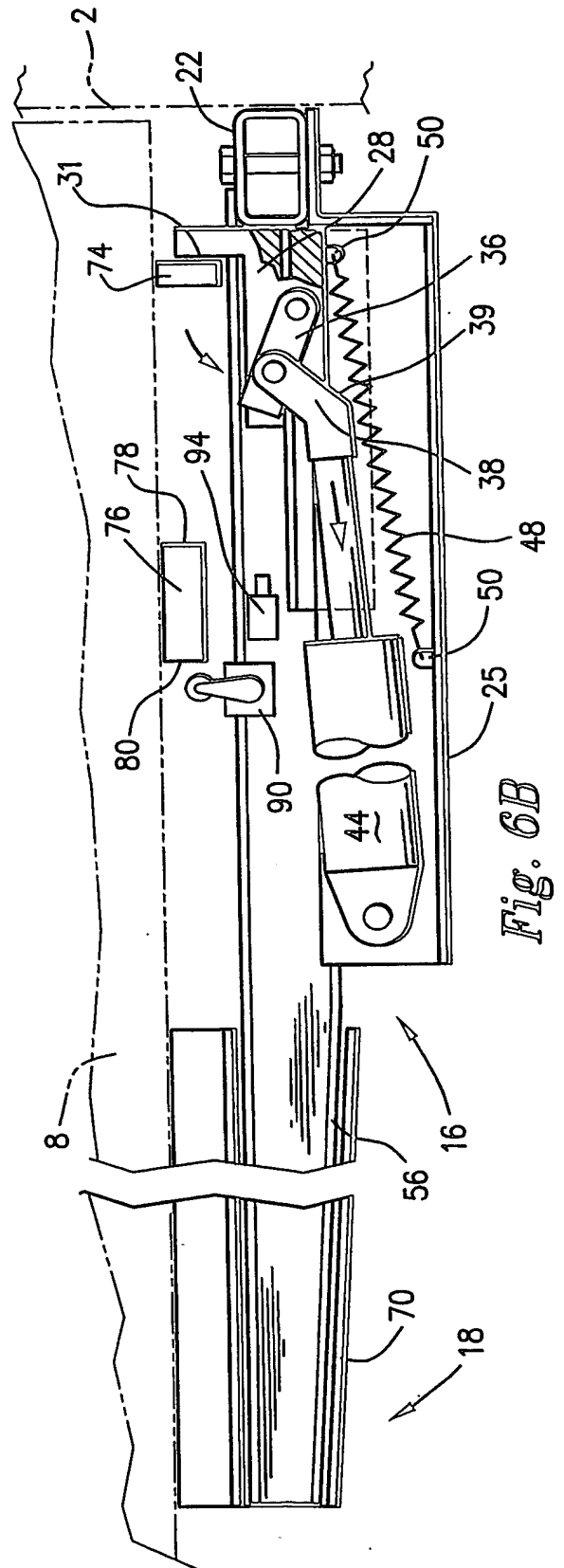
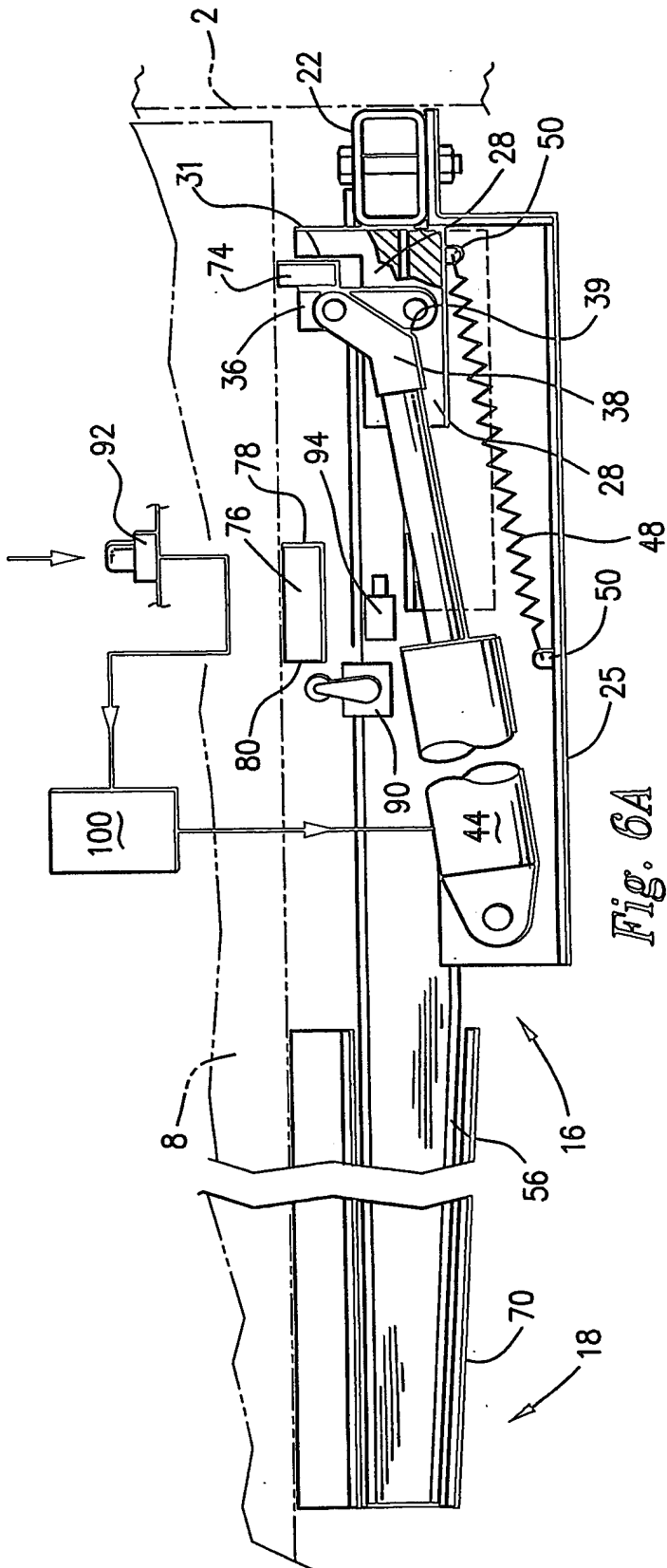
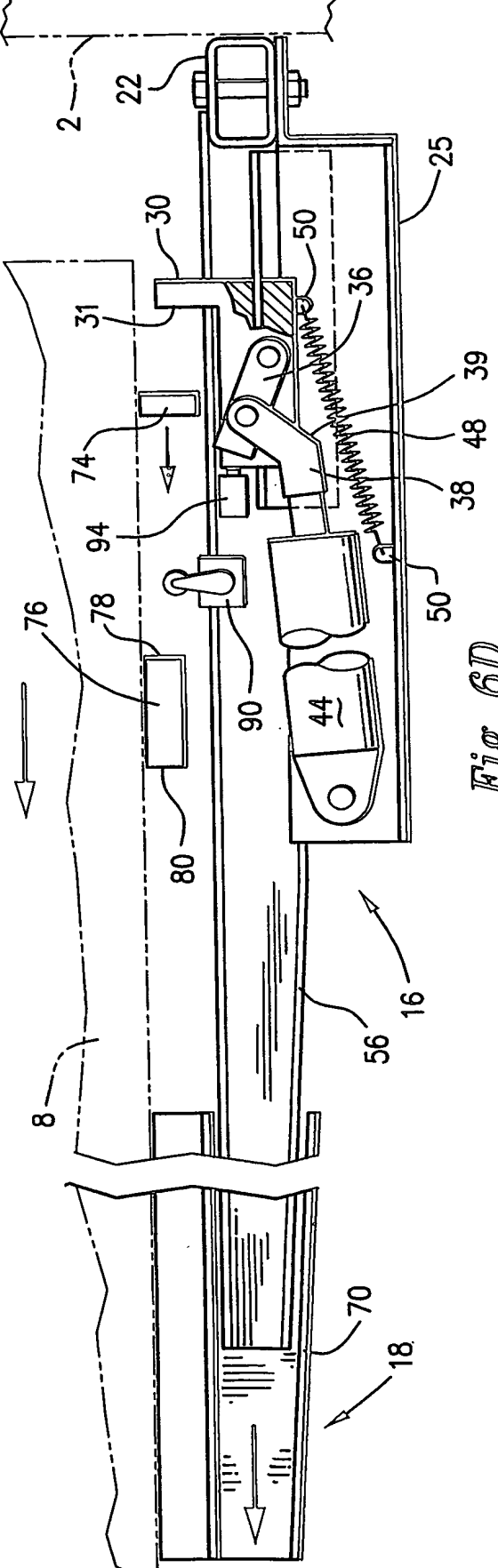
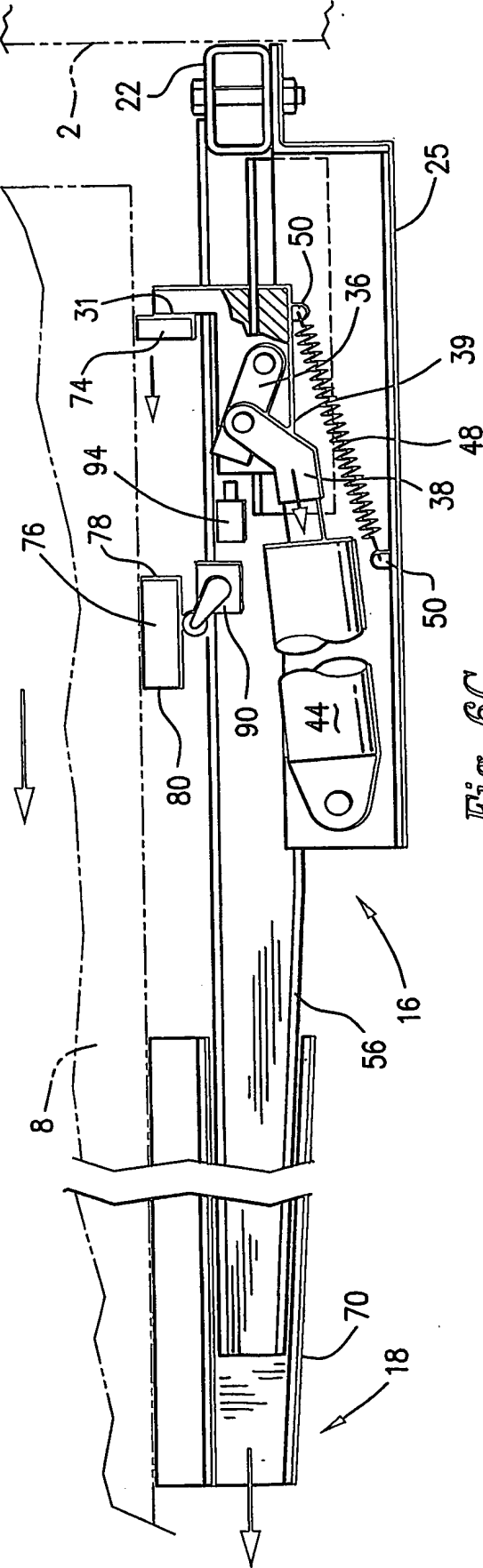


Fig. 5C





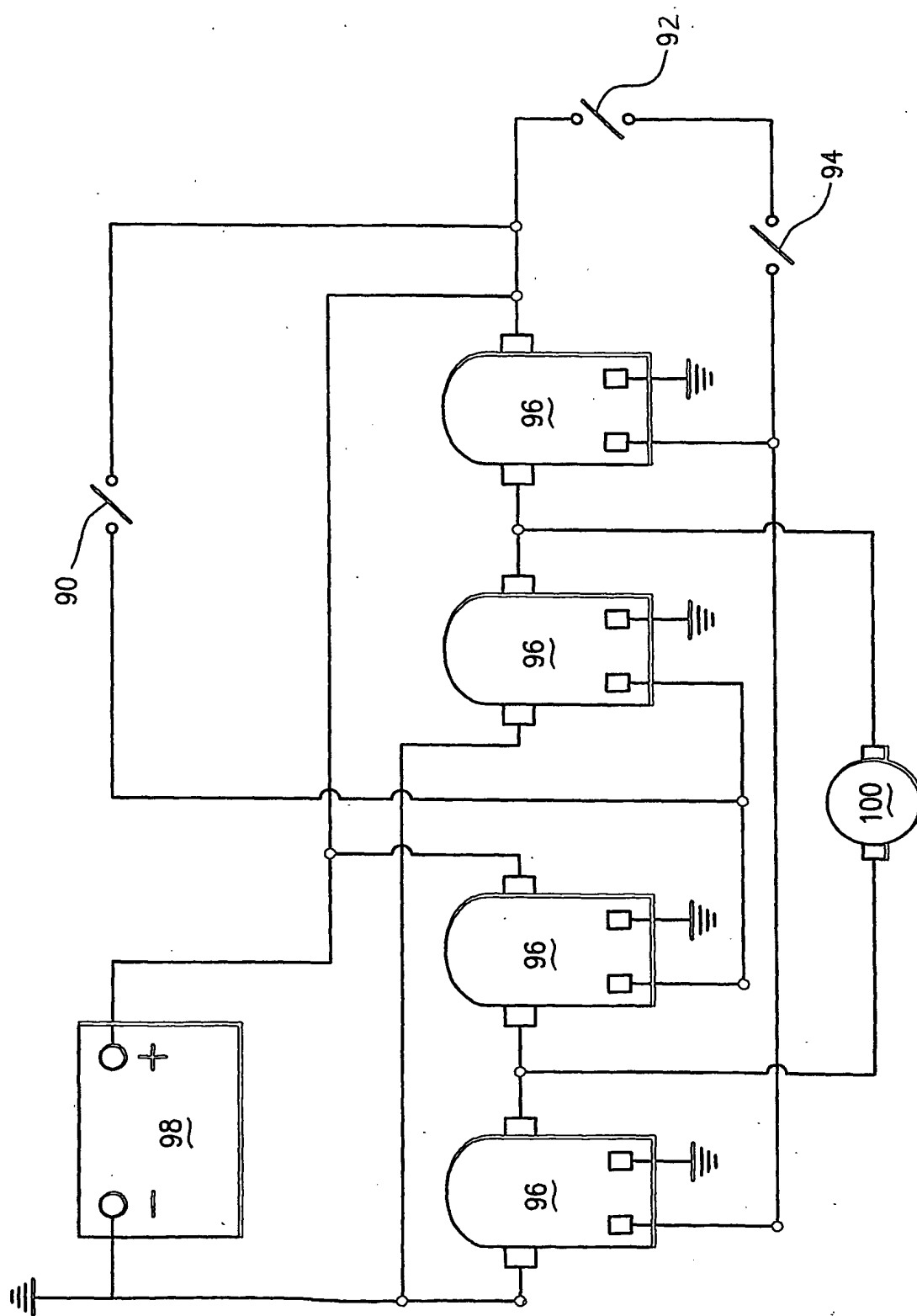


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/00449

A. CLASSIFICATION OF SUBJECT MATTER												
Int. Cl. ⁷ : B60P 1/64, 3/42, 3/33, 3/345; B60D 1/36; B62D 53/04, 63/08												
According to International Patent Classification (IPC) or to both national classification and IPC												
B. FIELDS SEARCHED												
Minimum documentation searched (classification system followed by classification symbols)												
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched												
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI: IPC B60P 001/64/IC, B60D 001/IC, B62D 053/04/IC, B62D 063/IC and key words CONNECT, ATTACH etc., FRICTION, RAMP etc.												
C. DOCUMENTS CONSIDERED TO BE RELEVANT												
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
X	US 5718554 A (McELROY) 17 February 1998 Whole document	1-34										
X	GB 2220921 A (JOHN G RUSSELL (TRANSPORT) LIMITED) 24 January 1990 Whole document	1-34										
X	GB 2240751 A (RITSON) 14 August 1991 Whole document	1-34										
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex												
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family											
"P" document published prior to the international filing date but later than the priority date claimed												
Date of the actual completion of the international search 6 June 2003		Date of mailing of the international search report 17 JUN 2003										
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer L. DESECAR Telephone No : (02) 6283 2381										

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/00449

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 90/08052 A (SFERLAZZO) 26 July 1990 Whole document	1-34
X	DE 3108123 A (HÜFFERMANN) 16 September 1982 Whole document	1-34
X	DE 3501107 A (PAUL) 17 July 1986 Whole document	1-34
X	US 4314726 A (ARTWEGER et al.) 9 February 1982 Whole document	1, 17-18, 20
X	US 5967596 A (KNOOP) 19 October 1999 Whole document	1, 17-18, 20
X	Derwent Abstract Accession No. G8430Y/33, Class Q15, SU 534378 A (LENTORGBYTTRANS CAR) 3 March 1977 Abstract	1, 17-18, 20
X	AT 396347 B (WILHELM SCHWARZMÜLLER G.M.B.H.) 25 August 1993 Whole document	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/00449

Box I **Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II **Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-34

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/00449

Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: II

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are two different inventions as follows:

1. Claims 1-16 and 24-29 are directed to an apparatus for a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mountable position relative to the vehicle and being detachable therefrom, the apparatus involving the features as defined.
2. Claims 17-23 and 30-34 are directed to a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mountable position relative to the vehicle and being detachable therefrom, the vehicle assembly including respectively the apparatus as claimed in claims 1-16 and 24-29.
3. Claims 35-39 are directed to a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mountable position relative to the vehicle and being detachable therefrom, wherein the vehicle is provided with a first guide means fixed to the vehicle and the load is provided with a second guide means fixed to the load to position the load in the mounted position relative to the vehicle, the guide means involving the features as defined.

In assessing whether these claims possess a single general inventive concept the International Search Authority concludes as follows:

- (a) Independent claims 1, 24 and 17, 30 respectively share the common features in relation to an apparatus having a driving means with the features as defined respectively. It is considered that unity exists *a priori* between the inventions defined in claims 1, 24, 17 and 30 since they possess the same special technical features.
- (b) Independent claims 1, 17, 24, 30 and claim 35 share the common features in relation to a vehicle assembly comprising a self propelled vehicle and a load mountable to the vehicle in a mountable position relative to the vehicle and being detachable therefrom. However these features are not novel for example in the light of the documents US 4314726 A (ARTWEGGER et al.) 9 February 1982 and US 5967596 A (KNOOP) 19 October 1999. Consequently the common features are not a special technical features within the meaning of PCT Rule 13.2, second sentence, since they make no contribution over the prior art. Therefore the invention as define in the claims 1, 17, 24, 30 and claim 35 lack unity *a posteriori*.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU03/00449

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report			Patent Family Member				
US	5718554	NONE					
GB	2220921	NONE					
GB	2240751	AU	69068/91	BR	9007903	CA	2070397
		EP	504246	FI	922630	HU	66145
		NO	922244	WO	9108925		
AT	396347	AT	2920/89				
DE	3108123	NONE					
DE	3501107	EP	188280				
US	4314726	DE	3002108	ES	488024	ES	8102028
		GB	2046675	PL	221496		
US	5967596	NONE					
SU	534378	NONE					
WO	90/08052	NONE					
END OF ANNEX							